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FOLLICLE CELLS/ STEROIDOGENESIS

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OVARIAN FOLLICLES: CORRELATION BETWEEN ULTRASTRUCTURAL  
CHANGES, INDUCTION OF GERMINAL VESICAL BREAKDOWN (GVBD),  
AND STEROID HORMONE PRODUCTION. THESIS ADVISORS : PRAPEE  
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In order to investigate the correlation between maturation, steroidogenesis and ultrastructure of ovarian follicles in *Rana tigerina*, follicles between 0.8 to 1.7 mm in diameter (with 0.1mm increment) were investigated. The distribution pattern of these follicles was examined during the breeding season (May to August, 1998). The mean distribution of follicles with diameters of 0.8 to 1.4 mm (vitellogenic follicles) was about 5-10% whereas the mean distribution of 1.5 to 1.7 mm (full-grown) follicles ranged from 18-22 %. It was shown that the follicles were competent to respond to progesterone by undergoing maturation when their diameter was 1.4 mm (12%). The maturation observed in 1.5, 1.6 and 1.7 mm follicles were 72%, 79% and 100%, respectively. The appropriate dosage of frog pituitary homogenate (FPH) for stimulation of steroidogenesis in *R. tigerina* was 50 µg/ml. In order to examine the size of follicles when they shifted from estradiol (E<sub>2</sub>) to progesterone (P) production, follicles with various sizes were cultured in the presence of 50 µg/ml FPH. The highest amount of E<sub>2</sub> (1359 pg/ml) was produced by 1.4 mm follicles and then the levels were decreased in 1.5 and 1.6 mm, respectively. Full-grown follicles (1.7 mm) had lost the capacity to synthesize E<sub>2</sub>. Detectable amounts of P were first synthesized in 1.1 mm follicles and then levels gradually increased as the follicle size increased. The highest amount of P (1139 pg/ml) was synthesized and secreted by 1.7 mm follicles. To investigate the ultrastructure of follicle cells (FCs) during steroidogenesis, stage IV and VI follicles were cultured with FPH for 5 h and processed by conventional TEM. During steroidogenesis, mitochondria exhibited striking changes especially in stage VI FCs. Most of them were in close contact with one another and lost some parts of membranes, which resulted in the flow of the matrices into the cytoplasm. In addition, there were microchannels connected with the mitochondrial matrix which opened into the outer surface of FC plasma membrane.